ORACLES - P-3 Orion - WFF 10/05/18 Science Report

Aircraft: P-3 Orion - WFF (See full schedule)
Date: Friday, October 5, 2018
Mission: ORACLES
Mission Summary:

Transited on 5E to 9.0S, then headed east to find low-cloud-fraction region. At ~7E went south to 9.5S, then headed west. Did a radiation wall between approx. 5.5E and 7W on 9.5S. This included, in order:

- High-altitude overpass of line where we'll do radiation wall
- Square spiral from ~6km to surface in mostly-cloudy conditions toward east end of wall (~6.6E)
- Above-cloud leg
- In-cloud leg
- Below-cloud leg
- Brief 2nd above-cloud leg for AOD measurement
- 3 vertically-stacked legs in the plume for aerosol in-situ measurements
- 2nd high-altitude overpass of radiation wall line
- Square spiral from ~6km to surface in clear conditions (a "hole" in the cloud cover), towards west end of wall (~5.9E)
- Short below-cloud leg, in-cloud legs and above-cloud legs in transit back to 5E line
- Short in-situ aerosol leg in-transit back along 5E line

Boundary layer was the most polluted we've seen so far in ORACLES 2018. Cloud droplet number concentrations were accordingly elevated, in both the satellite retrievals and in the P3 cloud probe measurements. Based on chemical ratios from the aerosol in-situ measurements it also appeared to be a more aged plume than on other days in ORACLES 2018. This will make a very good case for radiative closure, given the two square spirals in different conditions, the full radiation wall, and the moderate RH in the plume (which makes it easier to estimate the ambient-RH aerosol extinction from the low-RH in-situ scattering and absorption measurements).

SPECIAL NOTES:

- Preliminary analysis indicates the aerosol measured on this flight was more aged than on other flights.
- Observed Kelvin-Helmholtz waves in top of aerosol layer on HSRL (e.g. see ~09:23-09:25UTC). Could also see this in 4STAR AOD variations.

Submitted by: Sarah Doherty on 10/22/18
File:
PRF05Y18_20181005_P3_ScienceReport.pdf
Related Flight Report:

P-3 Orion - WFF 10/05/18

Flight Number: ORACLES Science Flight #5
Payload Configuration: ORACLES
Nav Data Collected: No
Total Flight Time: 9 hours
Archive Data: 20181005 (122 binary files; 26 archive (plain-text) files; 39 image files)
Submitted by: Mike Cropper on 10/05/18
Flight Segments:

From:	FPST	**To:**	FPST
Start:	10/05/18 04:55 Z	**Finish:**	10/05/18 13:55 Z
Flight Time:	9 hours		
Log Number:	19P018	**PI:**	Jens Redemann
Funding Source:	Hal Maring - NASA - SMD - ESD Radiation Science Program		
Purpose of Flight:	Science		
Miles Flown:	2000 miles		

Flight Hour Summary:

	18P004	19P018

Flight Hours Approved in SOFRS	188.5	
Flight Hours Previously Approved		144
Total Used	44.5	110
Total Remaining		34

19P018 Flight Reports

Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining	Miles Flown
10/02/18	ORACLES Science Flight #3	Science	8.5	8.5	135.5	1940
10/03/18	ORACLES Science Flight #4	Science	8.5	17	127	1970
10/05/18	ORACLES Science Flight #5	Science	9	26	118	2000
10/07/18	ORACLES Science Flight #6	Science	8.4	34.4	109.6	2000
10/10/18	ORACLES Science Flight #7	Science	8.3	42.7	101.3	1970
10/12/18	ORACLES Science Flight #8	Science	5.3	48	96	800
10/15/18	ORACLES Science Flight #9	Science	7.8	55.8	88.2	1700
10/17/18	ORACLES Science Flight #10	Science	8.5	64.3	79.7	2000
10/19/18	ORACLES Science Flight #11	Science	8	72.3	71.7	1800
10/21/18	ORACLES Science Flight #12	Science	8.2	80.5	63.5	1800
10/23/18	ORACLES Science Flight #13	Science	8.1	88.6	55.4	1800
10/25/18	ORACLES Transit #1	Transit	7.8	96.4	47.6	2009
10/26/18	ORACLES Transit #2	Transit	7	103.4	40.6	2100
10/27/18	ORACLES Transit #3	Transit	5.8	109.2	34.8	1692
10/27/18	ORACLES Transit #4	Transit	0.8	110	34	72

Source URL: https://espo.nasa.gov/oracles/science_reports/ORACLES_-_P-3_Orion_-_WFF_10_05_18_Science_Report#comment-0

Page Last Updated: April 22, 2017

Page Editor: Brad Bulger

NASA Official: Marilyn Vasques

Flight Reports began being entered into this system as of 2012 flights. If there were flights flown under an earlier log number the flight reports are not available online.

18P004 Flight Reports

Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining	Miles Flown
09/17/18	ORACLES ATF	Check	1.3	1.3	187.2	0
09/19/18	ORACLES PTF	Check	3.7	5	183.5	0
09/21/18	ORACLES Transit #1	Transit	6.3	11.3	177.2	1716

09/22/18	ORACLES Transit #2	Transit	8.2	19.5	169	2131
09/24/18	ORACLES Transit #3/Science Flight	Transit	9.3	28.8	159.7	2500
09/27/18	ORACLES Science Flight #1	Science	8	36.8	151.7	1875
09/30/18	ORACLES Science Flight #2	Science	7.7	44.5	144	2400